

A CLASSIFICATION OF OUR LIMNEPHILID CADDICE FLIES.

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The Limnephilidæ are the most prominent family of caddiceflies in temperate regions. Their classification has been largely based on the spur formula; this is undoubtedly valuable, but as it broke down in places, I have tried many times to find other characters. I divided the group into two on the presence or absence of spines on the under side of the last joint of the hind tarsi. Dr. Ulmer has brought up a few exceptions. Some I believe are due to the fact that the species is wrongly placed, but in certain *Chætopteryx* it does not hold, but when used in connection with the armature of the front tibiæ, it is decisive. The venation in this family is most distressingly uniform, and I have found little not already utilized. The large bristles back or inward of the ocelli I have used as of generic value; and the development of the strips of bristles on the mesothorax I also consider important. I had hoped to find more characters in the face, and palpi; and think that the vestiture of face may yet be used with success. However, I present this preliminary table in the hope that its use may discover the weak points and suggest new characters. I am loath to make so many new genera; but I believe that all are distinct groups, and future study may show some of them to be better placed as subgenera.

KEY TO THE GENERA OF LIMNEPHILIDÆ.

1. Last joint of hind tarsus with one or more distinct (usually black) spines beneath; tibia I always spined to base (*Limnephilinæ*) 2
 Last joint of hind tarsus without a distinct spine beneath; if one is occasionally present, then the tibia I is not spined to base (*Drusinæ*) 18
2. No prominent macrochætæ behind or inward from ocelli, although sometimes hairs much smaller than macrochætæ; tips of fore wings not obliquely truncate 3
 At least one prominent macrochæta behind or inward from each ocellus, about equal in size to the macrochætæ of the posterior warts; tips of fore wings often obliquely truncate 13.

3. Bristles on the veins no longer than those on the membrane, or barely so; membrane not granulate; median part of mesonotum with some bristle-bearing granules; the pronotum rather large; hind wings much excised on outer margin. 4
 Bristles on the veins noticeably longer than those on the membrane; median part of the mesonotum without bristle-bearing granules; hind wings scarcely excised on outer margin. 5

4. Outer margin of fore wings sinuately emarginate; vertex without distinct posterior warts *Glyphotaelius*.
 Outer margin of fore wings not emarginate; posterior warts distinct *Arctacia*.

5. In hind wings a cross-vein between the subcosta and radius near tip; vertex convex, smooth, posterior warts reduced *Astenophylax*.
 No such cross-vein in the hind wings, vertex flat; posterior warts well developed. 6

6. Vertex, part of thorax, and fore wings with dense appressed hair; basal cross-veins very weak; fore wings not granulate, with a median silvery stripe *Hesperophylax*, n. gen.
 (*Platyphylax occidentalis* Bks.)
 Vertex not with dense appressed hair. 7

7. Spurs 1, 2, 2, in hind wings the discal cell does not reach before the median fork; fore wing roughened. *Allegophylax*, n. gen.
 (*Platyphylax subfasciata* Say).
 Spurs 1, 3, 3, or 1, 3, 4. 8

8. Spurs 1, 3, 4. 9
 Spurs 1, 3, 3. 11

9. In the hind wings the discal cell reaches plainly before the forking of the median vein. 10
 In the hind wings the discal cell not before the forking of median vein; membrane of fore wings roughened *Eustenace*, n. gen.
 (*Stenophylax limbatus* McL.)

10. Large species; wings very broad; in fore wings the front side of discal cell is slightly concave *Stenophylax*.
 Smaller species: elongate wings; in fore wings the front side of discal cell is nearly straight *Rhadicoleptus*.

11. In the hind wings the discal cell but little if any before the forking of the median vein; second apical cell of fore wings wide at base, membrane granulate..... *Pycnopsyche*.
 In the hind wings the discal cell plainly before the forking of median vein..... 12

12. Large full winged species; membrane not granulate *Clistoronia*, n. gen.
 (*Halesus magnus* Bks.)
 Small, female short-winged; hairs on the membrane of fore wing as long as those on the veins..... *Psychoronia*, n. gen.
 (*Psilopteryx brevipennis* Bks.)

13. Anal cell not divided at base; spurs 1, 3, 3; fourth apical cell in hind wings broad..... *Platycentropus*.
 Anal cell divided as usual at base; spurs usually 1, 3, 4..... 14

14. Fifth joint of tarsus I with spines beneath; bristles on veins barely longer than on the membrane..... *Grammataulius*.
 Fifth joint of tarsus I without spines beneath; bristles on veins much longer than those on membrane..... 15

15. Hind wings strongly emarginate on outer margin near end of the cubitus; pronotum large and prominent; discoidal cell very long..... 16
 Hind wings scarcely emarginate at end of cubitus; pronotum less prominent..... 17

16. Fore wings long and slender, tips rounded..... *Anabolina*.
 Fore wings shorter, tips more acute; pronotum longer *Colpotaulius*.

17. Fourth apical cell in hind wings narrowed at base; mesothoracic strips long; outer margin of fore wings oblique *Limnephilus*.
 Fourth apical cell in hind wings not narrowed at base; mesothoracic strips short; outer margin of fore wings more rounded *Anabolia*.

18. Bristle-bearing granules scattered over the mesonotum without leaving a median smooth area; pronotum large and prominent; fork 3 in both wings pedicellate; spurs 1, 3, 4..... *Leptophylax*.
 Bristle-bearing granules arranged in two strips, leaving a smooth median area..... 19

19. Posterior and anterior anastomoses of fore wings not separated; no macrochaetæ behind ocelli; forks 1 and 3 in hind wings pedicellate; spurs 1, 3, 4..... *Homophylax*.
 Posterior anastomosis at least width of a cell before the anterior anastomosis..... 20

20. Outer margin of fore wings sinuately excised; macrochaetæ behind ocelli; spurs 1, 2, 2..... *Glyphopsyche*.
 Outer margin of fore wings entire..... 21

21. Fork 3 absent in hind wings..... 22
 Fork 3 present in hind wings..... 23

22. Spurs 1, 3, 3; no wart between ocelli and the posterior warts..... *Oligophlebodes*.
 Spurs 1, 2, 2; a distinct wart between the ocelli and the posterior warts..... *Neophylax*.

23. Stigma with a cross-vein at its base, or at least strongly coriaceous..... 24
 Stigma without cross-vein, and not especially prominent..... 27

24. First apical cell narrowed at base; stigma not very prominent, but with cross-veins at base..... 25
 First apical cell broad at base; stigma coriaceous..... 26

25. Spurs 1, 2, 4; discal cell of hind wings open..... *Apatania*.
 Spurs 1, 3, 4; discal cell of hind wings closed..... *Allomyia*, n. gen.
 (*Apatania tripunctata* Bks.)

26. Spurs 1, 3, 3; membrane not granulate nor roughened..... *Halesechila*.
 Spurs 1, 2, 2; membrane more or less granulate; hairs on membrane as long as those on the veins..... *Chilostigma*.

27. Each cheek with a prominent spine beneath; first apical cell extending a long way back on the discal cell..... *Allophylax*
 No such spine on the cheek..... 28

28. A large tuft of long hairs at anal base of fore wings; outer fringe on coxa I. longer than width of coxa; antennæ strongly crenulate beneath; ocelli large; tibia I densely spined to base; bristles of veins not prominent; in hind wings discal cell reaches long before forking of median vein; large species..... *Dicosmæcus*.

Hair at anal base shorter, less dense, and that on anterior coxae short; smaller species; bristles of veins usually distinct..... 29

29. Spurs 1, 3, 3..... 30
Spurs 1, 2, 2, or 1, 2, 4, or 1, 3, 4..... 32

30. Anal cell not divided at base; basal veins obsolete; radius bent at stigma; no ocellar macrochaetae..... *Hylepsyche*, n. gen.
(*Halesus indistinctus* Walk.)

Anal cell divided as usual, most of basal cross-veins distinct..... 31

31. Radius bent at stigma, which is very distinct; membrane not granulate..... *Halesochila*.
Radius scarcely bent at stigma, which is not especially distinct; no ocellar macrochaetae..... *Drusus*.

32. Spurs 1, 3, 4; no distinct ocellar macrochaetae..... 33
Spurs 1, 2, 2, or 1, 2, 4..... 35

33. Fork 3 in fore wings acute at base, sometimes pedicellate..... *Algonquina*, n. gen.
(*Parachiona parvula* Bks.).

Fork 3 in fore wings not acute, but reaching before the anastomosis..... 34

34. Anastomosis is placed before end of the subcosta; the apical cells very long..... *Anisogamus*.
Anastomosis beyond end of the subcosta, apical cells normal..... *Apolopsyche*, n. gen.
(*Stenophylax minusculus* Bks.)

35. Ocellar macrochaetae present; spurs 1, 2, 4; wings rather narrow, first fork reaches a long distance back on discal cell..... *Ecclisomyia*.
Ocellar macrochaetae absent, spurs 1, 2, 2, or 0, 2, 2; membrane granulate..... 36

36. Discal cell shorter than the pedicel or barely longer..... *Potamorites*.
Discal cell much longer than its pedicel..... 37

37. Radial vein scarcely bent at the stigma, wings less broad..... *Ironoquia*.
(*Chaetopterygopsis parvula* Bks.).

Radial vein strongly bent at the stigma; wings broad..... *Chilostigma*.

NOTES ON THE GENERA

Arctæcia—Includes *A. consocia* Walk. The genus *Philarctus* is very close and perhaps identical.

Hesperophylax and *Allegophylax*—These were formerly included in *Platyphylax*, but, as already noted by McLachlan and Ulmer, not congeneric. *Allegophylax* also includes *P. lepida* Hag.

Eustenace—Includes also the *Stenophylax gentilis* of McLachlan.

Rhadicoleptus—Our *Asynarchus fumosus* and *A. flavicollis* will go in Wallengren's genus, and are quite different in appearance from the typical broad winged *Stenophylax*.

Asynarchus—The type species, *A. fusorius*, will run to *Anabolia*, and I see little reason for separating it; various other species, *iteratus*, *amurensis*, etc., will also go to *Anabolia*, but *A. cænosus* runs to *Stenophylax*; it should form another genus.

Clistoronia and *Psychoronia* include each only a single species.

Allomyia includes but one species.

Drusus—In this I include *Halesus sparsus* Bks. from Newfoundland.

Halesus—I do not find any true representatives of this in our fauna; in the above table it would run out near *Platycentropus*, having ocellar macrochætæ, and 1, 3, 3 spurs; but the anal area is normally divided.

Ecclisomyia—The European *Ecclisopteryx* has spurs 1, 2, 3; first fork not so far back on discal cell, and no ocellar macrochætæ.

Algonquina, type *Parachiona parvula* Bks., I propose for several species which I formerly kept in *Parachiona*, but the latter is quite different.

Ironoquia—Includes only the one species I have previously placed in *Chætopterygopsis*. In this latter genus there are ocellar macrochætæ. The genera *Heliconius* and *Anisitella* are really *Chætopterygopsis* with a variation in spur formula; they have the same peculiar fore wings, and also ocellar macrochætæ. *Catadice* has no ocellar macrochætæ.

Limnephilus—This genus contains by far a larger number of species than any other genus in the family, and several are rather aberrant and show affinity to *Anabolia*. *Goniotaulius* should be maintained, but I have not been able to find characters, except that the ocellar macrochætæ are nearer to each other than in the true *Limnephilus*.